found no cheerier, happier hearted folk on the face of the earth than they. There is nothing melancholy about the Pahári. It is perhaps extraordinary that any people who are content (for there is no necessity in this case) to take the place of beasts of burden should be so absolutely unaware of the depth of their own miserable degradation. But so it is, and they would no more thank Sir Frederick for drawing them as central figures in a picture of a "circle in Purgatory" than would the bare-backed inhabitants of the bazaar thank the good missionary for calling them indecent. If he tried to turn a Pahári into a hospital orderly, and to wean him from his mountains and his planks, the contract would not last for a week!

But it is necessarily only with the outward aspect of things Indian that the casual traveller can possibly deal, and it is the freshness and vigour of Sir Frederick's descriptions of native life, his love of colour and nature, that make the charm of his book. Can anything be better than his description of the small shopkeeper of the bazaar? He "lives in the street *coram populo,* and his inner life is generously laid open to the public gaze. In the morning he may think well to wash himself in front of his shop, and to clean his teeth with a stick while he crouches amongst his goods and spits into the lane. He sits on the ground in the open to have his head shaved and watches the flight of the barber's razor by means of a hand glass. The barber squats in front of him and from time to time whets his blade upon his naked leg. The shopkeeper will change his clothes before the eyes of the world when so moved. He also eats in the open, and after the meal he washes his mouth with ostentatious publicity and empties his bowl into the road."

In moving amongst the historical cities of India and in describing them in detail there is, of course, a danger of treading on the skirts of the guide book. Sir Frederick only escapes the peril by the strength and beauty of his descriptions of these relics of the past and his keen appreciation of the stories that these stones can tell; his power of investing palaces and forts with all the movement and glitter, the coming and going, of past races of kings, making these old walls live once more under the light of an India which shall never be again. It is all delightful reading, and the stirring India of Sir Frederick's imaginings owns an enchantment which is wanting in the shadowed India of his latter day observation. There is not much said about Calcutta. The flavour of the place, that "essence of corruption which has rotted for a second time" (Kipling), seems to have been too much for the author; and yet we know that Calcutta is reckoned (statistically, at least) to be one of the wholesomest cities of the world, even when judged by the European standard.

Passing from India to Burma one is not surprised at the air of relief which pervades his book when dealing with that bright and laughter-loving land. Not even the stern critic of woman's mission in camp and hospital can resist the fascination of the Burmese coquette; and his description of Burma and Ceylon (where, *en passant,* the eminent surgeon was introduced to the devil of appendicitis and found him "unreasonably noisy") includes the best and brightest chapter in the book.

China falls again within the shadows cast by the far side of the lantern. The "nightmare city of Canton," where "such peace as is to be found in the city lies only on the green hill side without the walls, where the dead are sleeping," gives the key note of the almost morbid view of Chinese social existence which is taken by the author; and yet throughout his story of China and Japan (which country he also finds somewhat disappointing) there is the same brilliancy of description, the same fertile power of supplying precisely the right touch that is required to complete the sketch, that marks the work as original from beginning to end. It is almost Kiplingesque (to coin a word) in its epigrammatic summary of the usually complicated view of eastern humanity and its environment. It is the best book of travel that has been written for years; and yet when one lays it down regretfully (regretfully because it has come to an end), a feeling of thankfulness steals over one that the endless procession of human life and all the sweet variety of nature in the east is usually ranged for view before our eyes untinted by the medium of medical spectacles. T. H. H.

A BOOK ON MUSEUMS.

Museums, their History and their Use; with a Bibliography and List of Museums in the United Kingdom. By D. Murray. 3 Vols. Vol. i., pp. xv+339; vol. ii., pp. xiii+339; vol. iii., pp. 363. (Glasgow: MacLehose and Sons, 1904.) Price 32*s.* net.

WE have read the text of the first volume of this work (the second and third are devoted to bibliography, &c.) from title-page to index with the greatest pleasure and satisfaction, and can therefore recommend it to the best attention of those interested in the history and progress of museums. The book itself offers an illustration of an evolution somewhat similar to that of many of those institutions, for it is based on an address delivered by the author, in his capacity as president, to the Glasgow Archæological Society so long ago as the winter of 1897, and from this slender foundation it has gradually grown to its present dimensions. Much of the original address appears to remain in the final chapter of the text, where we find the author comparing the state of museums in 1897 to what it was half a century earlier, and what he presumes it will be in the future.

The work, which claims to be the first really full and approximately complete account of museum history in general, is confessedly written from the standpoint of an archæologist rather than of a naturalist; and it is none the worse for this, although, as we shall point out, there are a few instances where it would have been well had the author taken counsel with his zoological colleagues. Before proceeding to a brief notice of some of the leading features of the text, it may be well to mention that the list of museums in the British Islands is based on the one prepared by the Museums Association in 1887, and

that in the bibliographical and "museographical" lists forming the subject of the second and third volumes, reference is made only to museums of which there are printed catalogues or descriptions, or to which reference is made in other works. Consequently, many museums, including a few of some importance, are not referred to at all. In the case of large institutions like the British Museum, only such publications as refer directly to the building and its contents are quoted, so that the strictly scientific "catalogues" find no place in Dr. Murray's lists. That these lists, which must have involved an immense amount of labour in their preparation, will prove of great interest to "museographists" in the future can scarcely be doubted. We are unable, however, to find any reference to Dr. A. B. Meyer's well known survey of European and American museums.

In his first chapter the author discusses what we may call rudiments of museums, directing special attention to curiosities and rarities preserved in churches and cathedrals. Among these we miss a reference to the horn of the aurochs, or extinct wild ox, preserved in the cathedral at Strassburg up to the time of the French revolution. "Some Old Exhibits" forms the title of the sixth chapter, in which reference is made to our ancestors' extraordinary belief in the medicinal value of mummy, "unicorn's horn," and such like. In discussing the so-called giants' bones, the author makes a strange mistake (pp. 46 and 47) in regard to the bones which were assigned early in the seventeenth century to Teutobochus Rex, stating that they turned out to be those of a giant salamander, whereas they were really those of a mammoth. Dr. Murray has evidently confused these remains with Scheuchzer's *Homo diluvii testis,* based on the fossil salamander of the Œningen Pliocene.

Here we may take the opportunity of alluding to certain other errors in connection with zoological matters. On p. 58, for instance, we find the name of the red deer given as *Cervus elephas,* which might well be attributed to the "printer's devil" were it not that a few lines later the author deliberately states that this animal was the ἔλεφας of the Greeks! Again, in discussing the barnacle-goose myth, the author makes the following statement (p. 76):—

"Sir Robert Sibbald, about the same time, examined the whole subject personally, and showed that the Barnacle goose (*Bernicla leucopsis*) was a bird produced from an egg, and that the Barnacle shell (*Concha anatifera*) instead of being that egg was a *pholas*; the Scots piddocks."

If Sibbald made this misidentification, the mistake should have been pointed out—we scarcely dare think the author believes it to be true. As a minor error, it may be pointed out that the skeletons referred to on p. 187 as those of the mammoth are really referable to the mastodon. Finally, the statement on p. 136 that the Sloane herbarium "has recently been transferred from *Montague House* to the Natural History Museum" is scarcely exact or up to date.

Reverting to our survey of the contents of the first volume, we find in chapter vii. an account of some of the earliest museums, while in the eighth chapter those in existence at or about the date of the foundation of the Royal Society (1660) are discussed in considerable detail. A whole chapter is devoted to the history of the collections which formed the basis of the British Museum, and the gradual development of that institution. Museums for the exhibition of special subjects and the museums of Scotland next claim attention. From these the author passes on to museums which were "run" for profit, such as the well known museums of Lever and Bullock in London. Incidentally, it is mentioned how the former of these was disposed of *en bloc* by means of a guinea lottery; and from this there is an easy transition to the breaking-up of museums, with, in certain cases, the total loss of some of the most valuable of their contents.

In the fifteenth chapter Dr. Murray describes the arrangement—or rather want of arrangement—of the old style of museum, and takes occasion to express regret that a sample of one of these has not been preserved to our own day, as an illustration of museum evolution. Thence we pass on to modern museum arrangement, local museums, and the use of museums in general. In connection with museum buildings, it is interesting to note that Haltman, a pupil of Linnæus, advocated the importance of having a north light to the main galleries—advice which has been strangely neglected in the planning of many of our modern institutions. Of the importance of local museums, if run on right lines, and not made into mere curiosity shops, the author is fully convinced; but he is also equally convinced that they should not be left to the administration of local bodies, the members of which, as a rule, have but little conception of their true needs and purpose.

With regard to public museums in general, and especially those of the metropolis and our larger cities, Dr. Murray insists that modern methods of conservation and exhibition, and especially the labour of writing descriptive labels (which have to be from time to time renewed to keep pace with scientific progress), must entail constantly increasing expenditure, both in respect to the staff and to the upkeep of the whole establishment. In one passage (p. 280) he incidentally mentions that specimens shown in a museum do not grow out of date, apparently oblivious of the terrible effects of light in destroying so many zoological exhibits. His arguments for the increase of expenditure in the upkeep of museums are therefore, to a certain extent, understated rather than overestimated.

In regard to the general awakening of the country to the necessity of adequate training in every branch of culture and every department of industry, Dr. Murray writes as follows:—

"One of the most potent engines by which this is to be secured is the museum. Some of our museums are among the finest in the world; many are lending valuable assistance to the advancement and appreciation of art and science. A large number, however, are still content to be mere holiday resorts. All, even the best, must advance, and for this end enlightened and sympathetic administration and a liberal income are required. The museum of 1897 is

far in advance of the museum of 1847; but it in turn will be old-fashioned by the end of twenty years, and when the coming (= present) century is half-way through, its methods and arrangements will probably be wholly superseded by something better."

With these words we take leave of a very instructive and fascinating book, which it may be hoped will in some measure serve to awaken greater public interest in museums, and thereby enable them to receive adequate financial support from those responsible for their management. R. L.

ELEMENTARY PHYSIOLOGY.

(1) *A Primer of Physiology*. By Prof. E. H. Starling, F.R.S. Pp. viii+128. (London: John Murray, 1904.) Price 1*s*.

(2) *Elementary Practical Physiology*. By John Thornton, M.A. Pp. viii+324. (London: Longmans, Green and Co., 1904.) Price 3*s*. 6*d*.

(1) ASSUMING an elementary knowledge of the main facts of chemistry and physics on the part of the readers, Prof. Starling has endeavoured to present with as few technical terms as possible the leading ideas which make up present-day physiology.

It is clear that within the limited space of about 120 short pages the accomplishment of such a task is well-nigh impossible, and except in the accuracy of the stated facts due to the author's mastership of his subject, we do not think that the present attempt is more successful than those of others which have preceded it.

The great difficulty in writing such diminutive primers does not lie in the direction of finding matter to insert, but in a superabundance of material which must be left out if the reader is not to be stifled by a congested mass of facts crammed together into the shortest possible space, and as a consequence expressed in the tersest and baldest of language.

It is the difficulty of freeing the mind from the bondage of detail and dealing only with broad outlines which makes such primers dry and uninteresting reading, and causes one to sympathise with the children who are forced to read and to attempt to digest them mentally.

The primer at present under consideration is no worse, and perhaps somewhat better, in this respect than many similar productions; still, it would have served its purpose better if much of the detail had been left out, and room so provided for more ample treatment of the prominent and important aspects of the subject.

In the small amount of space at his disposal the author deals not only with the anatomy and physiology of the mammal, but finds room for some instruction regarding toxins and antitoxins, and a short chapter upon the defence of the body against micro-organisms. The introductory chapter takes up the consideration of the animal as a thermodynamic machine, includes the famous candle-burning experiment and the use of the calorimeter, and then passes rapidly to adaptive reactions, adaptation to poisons, and finally to antitoxins, thus showing that the whole of life is a series of adapted reactions.

In this chapter even the junior chemist who may read the primer will object to the illustration which shows him soda-lime as a fluid in bottles 1 and 4 of the illustration on p. 5, and it is to be feared that the junior physicist will be inclined to regard the calorimeter shown in section on p. 8 as a somewhat impossible piece of apparatus.

The remaining chapters furnish accounts of structure, food, digestion, circulation of the blood, breathing, exertion, the skin and its uses, the history of the food in the body, the chemical factories of the body, the defence of the body against micro-organisms, the physiology of movement and the muscles, the central nervous system, feelings—the whole contained in 112 brief pages, and forming a veritable *multum in parvo*.

(2) It is somewhat difficult on first glancing through Mr. Thornton's book to understand why the word *practical* appears on its title-page, for by far the greater part of the text is purely descriptive, although at intervals directions for simple dissections and experiments are interspersed in an unobtrusive manner.

On looking at the page opposite to the descriptive title page, however, one discovers that it is a member of the "Practical Elementary Science Series" issued by the publishers, and intended, as the author states in his preface, to meet all the requirements of stage 1 (the elementary stage) as set forth in the syllabus issued by the Board of Education, and in similar syllabuses of other examining bodies. Hence both the "elementary" and the "practical" of the title form, so to speak, the "class name" of the series, and are suggested by the syllabus and examination which have evidently given rise to their existence.

It is, in the opinion of the reviewer, a pity that even elementary text-books of science should have to be written to suit the requirements of syllabuses and examinations, but it appears to be inevitable in view of the artificial manner in which a love of science is propagated in this country that the majority of our text-books must be so written.

It accordingly becomes a problem whether such books can best be written by experts engaged upon the particular subject treated, or by the schoolmasters engaged in teaching that subject along with others.

The schoolmaster can claim the advantage in that he is a teacher of children, and knows best how to put the subject so that they will understand it; also, being engaged year after year in preparing pupils for the examination, he knows the requirements of the situation so far as success in the examination is concerned; but his knowledge of the subject and his presentation of it must be chiefly second-hand, since the prosecution of the study is not his daily occupation. On the other hand, the specialist, while he can give a review of the subject from a living acquaintance with it, may fail signally in writing to suit the requirements of the syllabus and the examination, disappoint both teacher and scholars in this respect, and leave his publisher without a market.

The book before us will lead to no disaster in